

First Field Release of *Puccinia jaceae* var. *solstitialis*, a Natural Enemy of Yellow Starthistle

D. M. Woods, W. L. Bruckart¹, V. Popescu, and M. J. Pitcairn

The first efforts to develop a plant pathogen as a biological control of yellow starthistle, *Centaurea solstitialis* L., occurred in 1978. A rust, *Puccinia jaceae* var. *solstitialis*, was collected in Turkey, brought to the United States, and maintained at the USDA-Agricultural Research Service Foreign Disease-Weed Science Research Unit quarantine greenhouse in Frederick, Maryland. Extensive laboratory and greenhouse experiments provided the host specificity data that was used in a permit request submitted in 2000. The request to release the rust as a biological control in California received final approval in mid June 2003 for a limited number of field releases.

The first release took place on July 9, 2003, at an isolated ranch east of Napa, California. The conditions were poor for release of a pathogen of this nature (too hot and dry with mature, dry plants). However, efforts were made to increase the likelihood of success. The square meter of yellow starthistle to be inoculated was watered with 25 gallons of water to hydrate the soil and increase humidity. A suspension of 40 milligrams of urediniospores in 250 milliliters water and eight drops of a wetting agent was sprayed on the plants at 7:00 p.m. when the plants were no longer in direct sunlight. A plastic tent on a PVC frame was placed over the inoculated plants overnight to increase humidity and simulate dew. The tent was removed in the morning and then replaced again the following night for a second treatment of dew.

A second release was made on July 30, a few meters away from the first release site. Again, the inoculated plants were tented so they could receive two nights of dew. During an August 1 inspection of sample leaves from the first release, we detected the presence of a very few urediniospores of the rust. A few more pustules appeared during the next week, but most pustules quickly transitioned to producing teliospores. This suggests that the rust perceived a need to transition into the overwintering mode to survive the heat of summer.

We are currently propagating the rust in our greenhouse in Sacramento and storing spores to prepare for eventual statewide release of the biological control agent in 2004.

¹ USDA-Agricultural Research Service, Foreign Disease-Weed Science Research Unit, Fort Detrick, MD.